EtherFast® 10/100/1000 8+1 Workgroup GigaSwitch

Use this guide to install :

EGO801W

User Guide

LINKSYS®

Contents

Introduction

Your EtherFast® 10/100/1000 8+1 Workgroup GigaSwitch

Congratulations on purchasing your new Linksys EtherFast® 10/100/1000 Workgroup GigaSwitch for your network's 10/100/1000 migration needs. The EtherFast® 10/100/1000 Workgroup GigaSwitch is the easiest, most versatile way to boost your network's performance while migrating to the speed and power of Gigabit. Unlike hubs that ration your network bandwidth and may slow down with high data traffic, your Linksys Switch fuels each of your computers with full duplex transfer mode on top of dedicated bandwidth to unleash your network speed.

In migrating your network to Fast Ethernet's 1000Mbps speed, your new Linksys 10/100/1000 GigaSwitch is ready to go to work for you immediately. Apply this switching power to your network, and your data traffic efficiency improves several times over. Connect your file server to the Gigabit port, and speed up access time for all your users in just one move. And when you're ready, switch your way to full duplex speeds of up to 2000Mbps--the speed is yours!

Every Switch packs a complete suite of advanced data error detection features for surefire communication every time. Auto partitioning and data collision control ensure that not a single bit is lost during even the heaviest moments of network traffic. Built to last, your new EtherFast® 10/100/1000 Workgroup GigaSwitch delivers optimal high-end video, gaming, multimedia, database, and other speed-intensive applications at blazing speeds.

Features

- 8 Port 10/100 Mbps Auto-Detect Half/Full Duplex Switch Ports and 1 Gbps Full Duplex Switch Port
- Internal Built-In 256KB SRAM for Buffer Memory
- Capable of Storing Up to 4096 MAC Addresses with Address Learning
- Supports Store and Forward Architecture
- Non-BLocking Shared Memory Architecture
- Supports Aging Function and 802.3x Flow Control for Full Duplex and Back-Pressure Function for Half-Duplex Operation
- Supports Congestion Flow Control
- Provides 3 LEDs per Port to Indicate the Packets Traffic Pattern
- Signal Regeneration Ensures Data Transfer Integrity
- Free Technical Support—24 Hours a Day, 7 Days a Week for North America Only
- One-Year Limited Warranty

Package Contents

- • One 10/100/1000 8+1 Workgroup Gigaswitch®
- • One AC Power Adapter
- • One Stacking/Wall Mounting Module
- • One User Guide and Registration Card

Getting to Know the EtherFast® 10/100/1000 Workgroup GigaSwitch

The 10/100/1000 Workgroup GigaSwitch's Rear Panel
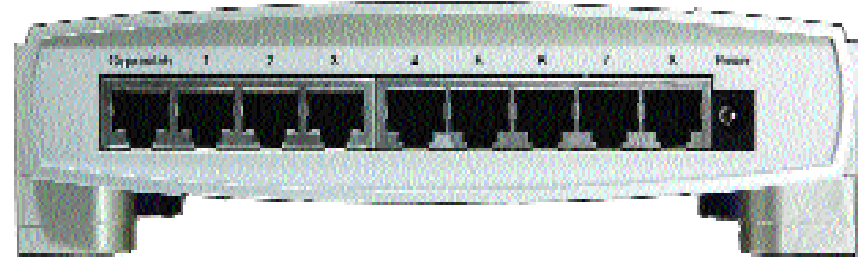
The Workgroup GigaSwitch's Ports

GigaSwitch　　　The **GigaSwitch** port is used to connect to the PC into which you have installed an Instant Gigabit Network Adapter. Or, it can be used to expand your network by connecting to a 1000Mbps hub or switch, which is done by simply running a Category 5e crossover cable from the **GigaSwitch** port to the uplink port on the 1000Mbps hub or switch. When connecting to an Instant Gigabit Network Adapter, just plug one end of a Category 5e crossover cable into the RJ-45 port on the Adapter and the other end into the GigaSwitch port on the GigaSwitch.

Ports 1-8　　　These eight **LAN** (Local Area Network) ports connect to network devices, such as PCs, print servers, network attached storage, and remote hard drives at 10/100Mbps.

Power　　　The **Power** port is where you will connect the power adapter.

The 10/100/1000 Workgroup GigaSwitch's Front Panel

Power   *Amber*. The **Power** LED lights up when the Switch is powered on.

Link/Act   *Green*. The **Link/Act** LED serves two purposes. If the LED is continuously lit up, the Switch is successfully connected to a device through the corresponding port (**1** through **8**). If the LED is flickering, the GigaSwitch is actively sending or receiving data over that port.

FD/Col   *Green*. The **FD/Col** LED also serves two purposes. If this LED is lit up continuously, the connection made through the corresponding port is running in Full Duplex mode. If the LED flickers, the connection is experiencing collisions. Infrequent collisions are normal. If this LED flickers too often, there may be a problem with your network.

10/100   *Amber*. The **10/100** LED lights up for any port when that port is operating at 100Mbps. If the LED is off while the network is operating, the port is operating at 10Mbps.

1000   *Amber*. The **1000** LED lights up when the Gigaswitch port is operating at 1000Mbps. If the LED is flickering, data is being transmitted through the port.

1000 Link/Act   *Green*. The **1000 Link/Act** LED lights up when the Gigabit port is operating at 1000Mbps.

1000 FD/Col   *Green.* The **1000 FD/Col** LED lights up continuously when the switch is operating at 2000Mbps and flickers when experiencing data collisions.

Planning Your Network

Overview

Building a Gigabit network involves more topology rules in addition to the 10BaseT/100BaseT network rules. These rules specify distance limitations and cabling specifications. Data loss, collisions, and other network problems causing down time are likely to occur if the rules below are not followed.

- Use UTP Category 5 (or better) Ethernet cabling with four pairs of wires and RJ-45 tips for all Fast Ethernet connections. Gigabit connections should use Category 5e (or better).

- Use the chart below to position your switches, hubs and workstations.

From	To	Maximum Distance
Switch	Switch or Hub*	100 meters (328 feet)
Hub*	Hub*	5 meters (16.4 feet)
Switch or Hub	Workstation	100 meters (328 feet)

*Hub refers to any type of 100Mbps hub, including regular hubs and stackable hubs. A 10Mbps hub connected to another 10Mbps hub can span up to 100 meters (328 feet).

- No more than two hubs should be uplinked in a row in a Fast Ethernet network. A set of stacked hubs, which must be stacked with a stacking cable, counts as one hub or node on the network.

- In Fast Ethernet networks, your 10/100 Switch acts as a repeater, regenerating data signals before passing them on to the next device. Passive hubs do not function as repeaters.

Switches Versus Hubs

Your Workgroup GigaSwitch boosts your network performance several times over, conserving your time, money and resources. The scalability of your Switch, its full duplex data transfer and dedicated bandwidth all contribute to maximizing efficiency in your Fast Ethernet network.

Your Switch's **10/100** feature gives you a key advantage over other forms of networking by upgrading speed-critical network segments to 100Mbps while allowing existing 10BaseT networks to operate with the Switch. Allowing 10BaseT and 100BaseTX hardware speeds to run alongside each other elimi-

nates the need to purchase new hardware, rewire and reconfigure an entire site all at once. This **scalability** factor ensures that Fast Ethernet will not fall obsolete to upgrades in speed standards and maintains use of all your old equipment until you decide to buy speedier replacements.

Scalability allows you to budget for your networking needs over time. Now networks can run fast and slow segments at the same time for different users and departments.

Switches also feature **full-duplex data transfer**, meaning that all computers on the switch can "talk" to the switch at the same time. Plus, switches can send and receive data simultaneously to all connections, whereas a hub cannot. A hub simply works with one computer at a time and only sends or receives data, since it cannot handle two way communication.

In addition to full-duplex transfer, your Switch surges your network with **dedicated bandwidth** to each node.   For instance, if you connect five computers to your EtherFast 10/100/1000 8+1 Workgroup GigaSwitch, then each computer will get a dedicated bandwidth of 100Mbps at full duplex transfer. If you run 5 computers from a 100Mbps hub, then each computer will only share a part of the 100Mbps bandwidth.

A network without a switch is called a **shared network** because every node on the network competes for a fraction of the total bandwidth. In a shared network, data packets are randomly broadcasted to all stations until they discover their intended destination. Consequently, considerable time and bandwidth is wasted on data packets swimming along network lines before they find their correct address. A switch, on the other hand, looks at the address for each data packet and delivers it directly to the correct destination.

Gigabit Ethernet is ideal for deployment as a backbone interconnect between 10/100BASE-T switches, and as a connection to high-performance servers. With the addition of Gigabit Ethernet, Ethernet delivers scalable solution (10/100/1000 Mbps) for the LAN from the desktop to the workgroup, and the backbone.

Installing the EtherFast® 10/100/1000 8+1 Workgroup GigaSwitch onto Your Network

Overview

Installing your EtherFast® 10/100/1000 8+1 Workgroup GigaSwitch may involve installing both an adapter and the GigaSwitch. If you are integrating these items into an existing nework, some additional steps may be necessary involving settings for your existing equipment. Consult your Network Administrator for more information about how the GigaSwitch will interface with your existing network components.

Installing The Workgroup Gigaswitch

Connecting Computers To Your Switch

Your Switch's rear panel has eight standard RJ-45 ports, plus a Gigabit port. Each 10/100 port automatically detects the speed and duplex of the attached cabling to a network card, switch, hub, etc. The ports operate in either full or half duplex, which lets you run at speeds of 200Mbps, 100Mbps, 20Mbps or 10Mbps. The Gigabit port operates at 1000Mbps or 2000 Mbps.

Each 10/100 port on your Switch can connect to workstations, file servers, hubs, repeaters, bridges, routers or other switches. Connections to the switch require **UTP Category 5 network cabling** with RJ-45 tips, <u>not to exceed 100 meters</u> (328 feet) in length.

To connect a computer directly to the switch, plug one end of a standard network cable into the switch, then plug the other end of the cable into the computer's network adapter.

Connecting Your Hardware Together and Booting Up

Plug in the GigaSwitch's AC power adapter. The Power LED will light up. As devices make connections to the Switch's ports, each port's corresponding Link/Act LED will light up. The remaining LEDs will also light up according to how your connection is made, e.g. full or half duplex, 10Mbps or 100Mbps.

If the Switch experiences excessive data collisions, verify that your network cabling is securely crimped and installed properly.

Tips on Switching Your Network

Here are some of the ways your new EtherFast® 10/100/1000 8+1 Workgroup GigaSwitch can help you optimize your network speed.

• Speed up Nodes From Your 10BaseT Network

In a 10BaseT network, connect your hubs, file servers, and key users, such as network administrators, directly to your Switch to channel dedicated bandwidth in full-duplex mode (if operating in full-duplex) to each station. The Switch will have dedicated communication with all its connections simultaneously, whereas a hub will only communicate in half-duplex transfer mode and broadcasts information to all ports.

• Conserving Bandwidth with 10Mbps & 100Mbps Segments

10BaseT and 100BaseTX hardware are not readily compatible, but your 10/100 Switch can designate network segments of different speeds. This allows you to run one 10Mbps segment to serve users without a need for considerable speed, and a faster 100Mbps segment devoted to users who depend heavily on graphics, multimedia, database, or other speed-intensive applications. With switched segmentation, your 100Mbps users will not be slowed down by the users on the 10Mbps segment.

• Run 10Mbps Peripherals in Your Fast Ethernet Network

Most of the network peripherals in place today run at 10Mbps, since 10BaseT has been the standard network speed to date. These peripherals, designed to operate at 10Mbps, cannot readily communicate with 100BaseTX equipment. A 10Mbps interface is also required for cable and DSL connections, which are quickly becoming very popular ways to access the Internet. Your 10/100 Switch provides your 10BaseT equipment and cable and DSL lines with a 10Mbps interface while still running your Fast Ethernet devices at 100Mbps.

• Strengthen Data Transfers Through Signal Regeneration

Your Switch functions as a repeater, which regenerates data signals as they pass through it. This feature acts as a safeguard to deter data loss and ensure that transmissions arrive at their destination intact. Switches positioned between hubs can preserve your data's integrity and eliminate your need to buy and use repeaters in your Fast Ethernet network.

Glossary

10BaseT - An Ethernet standard that uses twisted wire pairs.

100BaseTX - IEEE physical layer specification for 100 Mbps over two pairs of Category 5 UTP or STP wire.

1000BASE-T - provides half-duplex (CSMA/CD) and full-duplex 1000Mbps Ethernet service over Category 5 links as defined by ANSI/TIA/EIA-568-A. Topology rules for 1000BASE-T are the same as those used for 100BASE-TX. Category 5 link lengths are limited to 100 meters by the ANSI/TIA/EIA-568-A cabling standard. Only one CSMA/CD repeater will be allowed in a collision domain.

Adapter - Printed circuit board that plugs into a PC to add to capabilities or connectivity to a PC. In a networked environment, a network interface card (NIC) is the typical adapter that allows the PC or server to connect to the intranet and/or Internet.

Auto-negotiate - To automatically determine the correct settings. The term is often used with communications and networking. For example, Ethernet 10/100 cards, hubs and switches can determine the highest speed of the node they are connected to and adjust their transmission rate accordingly.

Backbone - The part of a network that connects most of the systems and networks together and handles the most data.

Bandwidth - The transmission capacity of a given facility, in terms of how much data the facility can
transmit in a fixed amount of time; expressed in bits per second (bps).

CAT 3 - ANSI/EIA (American National Standards Institute/Electronic Industries Association) Standard 568 is one of several standards that specify "categories" (the singular is commonly referred to as "CAT") of twisted pair cabling systems (wires, junctions, and connectors) in terms of the data rates that they can sustain. CAT 3 cable has a maximum throughput of 16 Mbps and is usually utilized for 10BaseT networks.

CAT 5 - ANSI/EIA (American National Standards Institute/Electronic Industries Association) Standard 568 is one of several standards that specify "categories" (the singular is commonly referred to as "CAT") of twisted pair cabling systems (wires, junctions, and connectors) in terms of the data rates that they can sustain. CAT 5 cable has a maximum throughput of 100 Mbps and is usually utilized for 100BaseTX networks.

CAT 5e - The additional cabling performance parameters of return loss and far-end crosstalk (FEXT) specified for 1000BASE-T and not specified for 10BASE-T and 100BASE-TX are related to differences in the signaling implementation. 10BASE-T and 100BASE-TX signaling is unidirectional-signals are transmitted in one direction on a single wire pair. In contrast, Gigabit Ethernet is bi-directional-signals are transmitted simultaneously in both directions on the same wire pair; that is, both the transmit and receive pair occupy the same wire pair .

Data Packet - One frame in a packet-switched message. Most data communications is based on dividing the transmitted message into packets. For example, an Ethernet packet can be from 64 to 1518 bytes in length.

Dynamic Routing - The ability for a router to forward data via a different route based on the current conditions of the communications circuits. For example, it can adjust for overloaded traffic or failing lines and is much more flexible than static routing, which uses a fixed forwarding path.

Ethernet - IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium. Has a transfer rate of 10 Mbps. Forms the underlying transport vehicle used by several upper-level protocols, including TCP/IP and XNS.

Fast Ethernet - A 100 Mbps technology based on the 10Base-T Ethernet CSMA/CD network access method.

FTP (File Transfer Protocol) - A protocol used to transfer files over a TCP/IP network (Internet, UNIX, etc.). For example, after developing the HTML pages for a Web site on a local machine, they are typically uploaded to the Web server using FTP.

FTP includes functions to log onto the network, list directories and copy files. It can also convert between the ASCII and EBCDIC character codes. FTP operations can be performed by typing commands at a command prompt or via an FTP utility running under a graphical interface such as Windows. FTP transfers can also be initiated from within a Web browser by entering the URL preceded with ftp://.

Unlike e-mail programs in which graphics and program files have to be "attached," FTP is designed to handle binary files directly and does not add the overhead of encoding and decoding the data.

Full Duplex - The ability of a device or line to transmit data simultaneously in both directions.

Half Duplex - Data transmission that can occur in two directions over a single line, but only one direction at a time.

Hardware - Hardware is the physical aspect of computers, telecommunications, and other information technology devices. The term arose as a way to distinguish the "box" and the electronic circuitry and components of a computer from the program you put in it to make it do things. The program came to be known as the software.

Hub - The device that serves as the central location for attaching wires from workstations. Can be passive, where there is no amplication of the signals; or active, where the hubs are used like repeaters to provide an extension of the cable that connects to a workstation.

IEEE - The Institute of Electrical and Electronics Engineers. The IEEE describes itself as "the world's largest technical professional society -- promoting the development and application of electrotechnology and allied sciences for the benefit of humanity, the advancement of the profession, and the well-being of our members."

The IEEE fosters the development of standards that often become national and international standards. The organization publishes a number of journals, has many local chapters, and several large societies in special areas, such as the IEEE Computer Society.

LAN - A local area network (LAN) is a group of computers and associated devices that share a common communications line and typically share the resources of a single processor or server within a small geographic area (for example, within an office building).

Latency - The time delay between when the first bit of a packet is received and the last bit is forwarded.

MAC Address - The MAC (Media Access Control) address is your computer's unique hardware number.

Mbps (MegaBits Per Second) - One million bits per second; unit of measurement for data transmission.

Network - A system that transmits any combination of voice, video and/or data between users.

NIC (Network Interface Card) - A board installed in a computer system, usually a PC, to provide network communication capabilities to and from that computer system. Also called an adapter.

Port - A pathway into and out of the computer or a network device such as a switch or router. For example, the serial and parallel ports on a personal computer are external sockets for plugging in communications lines, modems and printers.

RJ-45 (Registered Jack-45) - A connector similar to a telephone connector that holds up to eight wires, used for connecting Ethernet devices.

Throughput - The amount of data moved successfully from one place to another in a given time period.

TX Rate - Transmission Rate.

UTP - Unshielded twisted pair is the most common kind of copper telephone wiring. Twisted pair is the ordinary copper wire that connects home and many business computers to the telephone company. To reduce crosstalk or electromagnetic induction between pairs of wires, two insulated copper wires are twisted around each other. Each signal on twisted pair requires both wires. Since some telephone sets or desktop locations require multiple connections, twisted pair is sometimes installed in two or more pairs, all within a single cable.

Specifications

Model Number	EG0801W
Standards	IEEE 802.3, IEEE 802.3ab, IEEE 802.3u, IEEE 802.3x
Protocol	CSMA/CD
Ports	Eight 10/100 RJ-45 Ports, One Gbps Full-Duplex Switch Port
Cabling Type	**10BaseT**: UTP/STP Category 3 or better
	100BaseTX: UTP/STP Category 5 or better
	1000BaseT: UTP/STP Category 5e or better
Topology	Star
Speed Per Port	10Mbps or 100Mbps (Half Duplex)
	20Mbps or 200Mbps (Full Duplex)
	1000Mbps or 2000Mbps (Gigabit Port)
LEDs	Power, 1000, 10/100, FD/Col, Link/Act, Full/Half Duplex, 1000 Link/Act, 1000 FD/Col

Environmental

Dimensions	7.31" x 6.06" x 1.88" (186mm x 154mm x 48mm)
Unit Weight	13.6 oz. (.39Kg)
Power	3.3V DC, 5A
Certifications	FCC Class B, CE Mark Commercial
Operating Temp.	32ºF to 122ºF (0ºC to 50ºC)
Storage Temp.	-4ºF to 158ºF (-20ºC to 70ºC)
Operating Humidity	10% to 85% Non-Condensing
Storage Humidity	5% to 90% Non-Condensing

Warranty Information

BE SURE TO HAVE YOUR PROOF OF PURCHASE AND A BARCODE FROM THE PRODUCT'S PACKAGING ON HAND WHEN CALLING. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE.

IN NO EVENT SHALL LINKSYS' LIABILITY EXCEED THE PRICE PAID FOR THE PRODUCT FROM DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT, ITS ACCOMPANYING SOFTWARE, OR ITS DOCUMENTATION. LINKSYS DOES NOT OFFER REFUNDS FOR ANY PRODUCT.

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Contact Information

For help with the installation or operation of this product, contact Linksys
Customer Support at one of the phone numbers or Internet addresses below.

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